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# FORAGE SPECIES AND PLANTING SEASON FOR RESEEDING CLEARED AND ABANDONED PONDEROSA PINE AREAS IN NORTHEASTERN WASHINGTON

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A large acreage of ponderosa pine land in northern Spokane County, Washington has been cleared, cropped unsuccessfully, and abandoned. This land is capable of producing greater amounts of livestock products by reseeding to desirable forage plants. On areas with open ponderosa pine stands typical of this locality, both timber and livestock can be produced to advantage.

What forage species are adapted to the weather and soil conditions of these areas and when should they be planted? Tests conducted since late 1950 by the Northern Rocky Mountain Forest and Range Experiment Station in cooperation with Raymond Koesel, local rancher, the Riverside Chapter Future Farmers of America, and the North Spokane Soil Conservation District have provided preliminary answers to these questions.

## DESCRIPTION OF STUDY AREA

The study area[1] was located 5 miles north of Chattaroy, Washington at an elevation of 2200 feet on a typical ponderosa pine site that had been cleared, cropped for several years, and abandoned. The soil was classified as a Springdale gravelly loam[2] formed from glacial outwash materials. It was characterized by weak profile development, low humus content, low water-holding capacity, and excessive drainage. Near the study area precipitation averages approximately 20 inches annually, with 20 percent of the total occurring during the months of April, May, and June. At the start it was estimated that 20 percent of the soil surface of the study area was covered with annual and perennial weeds such as cheatgrass (*Bromus tectorum*), pearl everlasting (*Anaphalis* sp.), flannel

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1/ Site selection and first plantings were by Grant Harris.

2/ From "Soil Survey of Spokane County, Washington," by C. Van Duyne et al. U. S. Dept. of Agric., Bureau of Soils. 108 pp. Illus. 1921.

Figure 1. Typical abandoned-plowed land in cut-over ponderosa pine type.

mullein (Verbascum thapsus), sheep sorrel (Rumex acetosella), low dogbane (Apocynum pumilum), Spanish clover deervetch (Lotus purshianus), knotweed (Polygonum sp.), amaranth (Amaranthus sp.), Klamath weed (Hypericum perforatum), and meadow salsify (Tragopogon pratensis). Five percent of the soil surface was covered with plant litter and the remaining 75 percent was bare.

## THE STUDY

About 30 different species, strains, and varieties of forage plants were planted in the fall of 1950, the spring and fall of 1951, and the spring of 1952 in plots of three rows 18 feet long and spaced 2 feet apart. The soil was prepared with a moldboard plow, disk, and harrow. All plantings were made with a Planet Jr. seeder. Success ratings of the reseeded species based on vigor and plant distribution within the rows were made periodically beginning with seedling emergence.

## RESULTS

### PLANTING SEASON

Based on the fall 1950 and spring 1951 plantings, species performance (Table 1) was better from the fall planting. Failures in both plantings were about equal with a larger number of species producing poor stands in the spring than in the fall planting. Species performing satisfactorily, i.e. rating fair, good, and very good, were 20 percent more frequent in the fall 1950 than in the spring 1951 plantings.

Table 1. Stand ratings of forage species by season and year of planting

| Season and year of planting | Very good | Good | Fair | Poor | Failed |
|---|---|---|---|---|---|
| | ----------Percent of total species planted--------- | | | | |
| Spring 1951 | 14 | 21 | 11 | 50 | 4 |
| Spring 1952 | 19 | 17 | 36 | 25 | 3 |
| Fall 1950 | 10 | 33 | 23 | 31 | 3 |
| Fall 1951 | 0 | 0 | 3 | 86 | 11 |

However, a comparison of plantings made in the fall of 1951 and spring of 1952 shows striking differences in favor of the spring planting. Of the species planted in the fall of 1951, 97 percent produced unsatisfactory stands or failed completely. On the other hand, 72 percent of the spring 1952 planted species produced outstanding or satisfactory stands of plants well distributed in the rows with the remaining species performing unsatisfactorily.

The unsatisfactory performance of the 1951 fall plantings is believed to have been caused by prolonged below-freezing temperatures for much of the period before the area became snow-covered. Temperatures and precipitation immediately after planting were favorable for seed germination and seedling emergence. However, before a lasting snowfall occurred, sub-freezing temperatures ranging from 15 to 31 degrees were recorded on 34 of 40 days in late October and November. Sub-zero temperatures during the months of December and January also may have affected the plantings but probably less than those occurring when the area was snowless. Observations made on November 27 showed that all species had germinated but only the legumes had emerged. However, the latter all died. The germinated species that did not emerge were adversely affected by the low temperatures. Many grasses are highly susceptible to temperature fluctuations during germination and the early seedling stages.

Despite unfavorable moisture conditions preceding and subsequent to the spring 1952 planting, species performance was very satisfactory. U. S. Weather Bureau records for Deer Park, supplemented by frequent observations at the area, indicate that precipitation was deficient throughout the growing season. In this planting, 28 percent of the species performed unsatisfactorily or failed. All the other species produced satisfactory stands and about half were outstanding.

## SPECIES PERFORMANCE

Several of the tested grasses appeared to be adapted to the growing conditions of the study area. Species evaluation was based on vigor and distribution of plants within the rows. The following performance groupings may be changed as more data become available.

Orchardgrass and seven wheatgrasses -- three strains of crested, intermediate, beardless bluebunch, Primar slender, and pubescent -- produced successful stands of uniformly distributed vigorous plants in the two spring plantings. Another group of species -- bluestem wheatgrass, Siberian wheatgrass, Manchar smooth brome, tall fescue, and hard fescue -- produced equally thrifty plants but they were unevenly distributed within the rows. Common and Bromar mountain brome, Russian wildrye, Idaho fescue, timothy, creeping and Ladak alfalfa, and big, Canby, and Canada bluegrasses were unsatisfactory in all respects when planted in the spring. The results from other species tested were too erratic for proper evaluation.

The performance of fall planted species was inconsistent in the two plantings. A group of species that was outstanding in the fall of 1950 included the most successful of the spring planted species plus tall, Idaho, sheep, and hard fescues and timothy. The following year, however, these species produced very unsatisfactory stands. The remaining species that were tested -- several other wheatgrasses, mountain and smooth brome, Russian wildrye, Indian ricegrass, five species of bluegrass, green needlegrass, milkvetch, and two varieties of alfalfa -- produced very poor stands or failed in both fall plantings.

## SUMMARY

Spring and fall plantings of approximately 30 forage species and strains have been made annually on cleared, cropped, and abandoned ponderosa pine land in north Spokane County since late 1950. A group of species including seven wheatgrasses and orchardgrass appear to be well adapted to growing conditions on such lands when planted in the spring. Results from the fall plantings cannot be fully evaluated because of inconsistency.

Although additional information is needed, current results indicate that these lands are capable of producing a greater amount of palatable herbage by reseeding in the spring to any of several forage grasses.